(3 Hours) **[Total Marks: 80]**

N.B.:-

1. Question No. 1 is compulsory
2. Attempt any three questions out of remaining five questions.
3. Figures on right hand indicate full marks
4. Assume suitable data if necessary and justify the same.

Q 1. Answer the following questions. (5 marks each) **20**

a. Draw a typical speed time curve and show there:
1.Notching up Period 2.Acceleration 3. Free-running period 4. Coasting & Braking

b. The distance between the lamps from the photometer heads are as follows for equal illumination on both sides of photometer screen.
(i) for standard lamp l_1 = 0.8 m. (ii) for lamp under test l_2= 1.5 m. The standard lamp is of 100 candle power. Find the candle power of lamp under test.

c. What is pinching effect? What is dependent on?
d. What are advantages of closed loop system over open loop system?

Q 2 a. Compare the features of different type of traction systems **10**
b.What are different methods of approximation of speed time curves? Derive an expression for distance travelled using quadrilateral approximation method of V(t) curves. **10**

Q 3 a. Explain the construction and working of fluorescent tube and compare it with tungsten filament lamp? **10**
b. Explain briefly various types of lighting systems **10**

Q 4 a. Draw and explain functional block diagrams of series, parallel and series-parallel HEV configurations. **10**
b. Compare all types of motors required in EV/HEV. **10**

Q 5 a Compare Vapour Compression and Vapour Absorption Type System. **10**
b. Explain with neat diagram Electric Circuit of Refrigerator. **10**

Q 6. a. Classify and Explain different types of Electric Welding. **10**
b. Classify and Explain different types of Induction Furnaces. **10**

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